

ABSTRACT OF THE INVENTION

Systems and methods for thermal sensing and imaging using the electro-optic effect. A thermal detection system comprises a temperature sensing element that includes an electro-optic (EO) material layer having a length axis and characterized by a temperature dependent index of refraction, an electrical mechanism for inducing a change in the index of refraction, a laser beam propagating lengthwise through EO layer for probing the refraction index change, and a light intensity meter for measuring a laser beam intensity change caused by the temperature dependent refraction index change. Thermal imaging is obtained by using a pixel array of such thermal sensing elements. The intensity reading may be done in either a cross-polarizer or a Mach Zehnder Interferometry reading configuration.